



**Pacific Gas and  
Electric Company**

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October 27, 2004

PG&E Letter DCL-04-140

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
11555 Rockville Pike, Rockville, Maryland 20852

Docket No. 50-275, OL-DPR-80  
Docket No. 50-323, OL-DPR-82  
Diablo Canyon Units 1 and 2  
60-Day Response to Request for Information on Generic Letter 2004-01,  
"Requirements for Steam Generator Tube Inspections"

Dear Commissioners and Staff:

This letter is a response to the Nuclear Regulatory Commission's request for information pursuant to Generic Letter (GL) 2004-01, "Requirements for Steam Generator Tube Inspections," dated August 30, 2004. GL 2004-01 requested licensees to submit a description of the steam generator tube inspections performed and an assessment of whether the inspections ensure compliance with the Technical Specifications requirements in conjunction with 10 CFR Part 50, Appendix B.

Enclosure 1 contains the 60-day response by Pacific Gas and Electric Company to the requested information of GL 2004-01.

If you have any questions, or require additional information, please contact Stan Ketelsen at (805) 545-4720.

Sincerely,

David H. Oatley

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October 27, 2004  
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kjse/4328

Enclosure

cc: Edgar Bailey, DHS  
David L. Proulx  
Diablo Distribution

cc/enc: Bruce S. Mallett

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

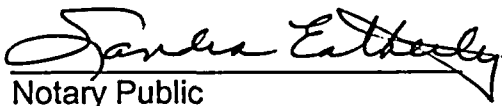
_____	)	Docket No. 50-275
In the Matter of	)	Facility Operating License
PACIFIC GAS AND ELECTRIC COMPANY	)	No. DPR-80
_____	)	
Diablo Canyon Power Plant	)	Docket No. 50-323
Units 1 and 2	)	Facility Operating License
_____	)	No. DPR-82

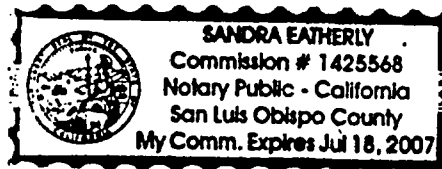
AFFIDAVIT

David H. Oatley, of lawful age, first being duly sworn upon oath says that he is Vice President and General Manager – Diablo Canyon of Pacific Gas and Electric Company; that he has executed this response to the NRC Generic Letter 2004-01 on behalf of said company with full power and authority to do so; that he is familiar with the content thereof; and that the facts stated therein are true and correct to the best of his knowledge, information, and belief.

  
\_\_\_\_\_  
David H. Oatley  
Vice President and General Manager

Subscribed and sworn to before me this 27th day of October 2004.

  
\_\_\_\_\_  
Notary Public  
County of San Luis Obispo  
State of California



**Response to the Requested Information of  
NRC Generic Letter 2004-01**

Below is Pacific Gas and Electric Company's (PG&E) 60-day response to NRC Generic Letter (GL) 2004-01, "Requirements for Steam Generator Tube Inspections," dated August 30, 2004.

NRC Request 1:

*Addressees should provide a description of the SG tube inspections performed at their plant during the last inspection. In addition, if they are not using SG tube inspection methods whose capabilities are consistent with the NRC's position, addressees should provide an assessment of how the tube inspections performed at their plant meet the inspection requirements of the TS in conjunction with Criteria IX and XI of 10 CFR Part 50, Appendix B, and corrective action taken in accordance with Appendix B, Criterion XVI. This assessment should also address whether the tube inspection practices are capable of detecting flaws of any type that may potentially be present along the length of the tube required to be inspected and that may exceed the applicable tube repair criteria.*

PG&E Response:

Diablo Canyon Power Plant (DCPP) Units 1 and 2 each have four Westinghouse Model 51 steam generators (SGs). The tubing material in each of the SGs is Inconel Alloy 600 mill annealed. The tubes are explosively expanded into the tube sheet using the Westinghouse explosive expansion process (WEXTEx).

Table 1 provides a description of the SG tube inspections performed at DCPP Units 1 and 2 during the last refueling outages, Unit 1 refueling outage twelve (1R12) in April 2004, and Unit 2 refueling outage eleven (2R11) in March 2003. Prior to each inspection, a degradation assessment, which includes operating experience, is performed to identify degradation mechanisms that may be present, and a technique validation assessment is performed to verify that the eddy current techniques are capable of detecting the degradation. For each tube location where degradation may be present, Table 1 includes the type of probe used for the inspection and the inspection scope.

DCPP Units 1 and 2 apply three different alternate repair criteria (ARC) that have been reviewed and approved by the NRC: voltage-based ARC for axial outside diameter stress corrosion cracking at tube support plates (TSPs), per GL 95-05; primary water stress corrosion cracking (PWSCC) ARC for axial PWSCC at dented TSPs, per WCAP-15573, Revision 1; and W\* ARC for axial PWSCC in the WEXTEx tubesheet region, per WCAP-14797, Revision 1. Many of the SG tube inspection requirements applied at DCPP Units 1 and 2 are the result of NRC commitments and Technical Specification requirements that implement the ARC.

A complete description of the 2R11 and 1R12 inspections, including the inspection results, are provided in PG&E Letters DCL-03-076, dated June 23, 2003 (2R11 90-day report), and DCL-04-112, dated September 7, 2004 (1R12 90-day report). These 90-day reports provide the detailed condition monitoring and operational assessment for all ARC and non-ARC degradation mechanisms.

The DCPD Units 1 and 2 SG tube inspection methods are consistent with the NRC's position regarding SG tube inspections. Therefore, the remainder of the requested information in NRC Request 1 is not applicable.

NRC Request 2:

*If addressees conclude that full compliance with the TS in conjunction with Criteria IX, XI and XVI of 10 CFR Part 50, Appendix B, requires corrective actions, they should discuss their proposed corrective actions (e.g., changing inspection practices consistent with the NRC's position or submitting a TS amendment request with the associated safety basis for limiting the inspections) to achieve full compliance. If addressees choose to change their TS, the staff has included in the attachment suggested changes to the TS definitions for a tube inspection and for plugging limits to show what may be acceptable to the staff in cases where the tubes are expanded for the full depth of the tubesheet and where the extent of the inspection in the tubesheet region is limited.*

PG&E Response:

The SG tube inspections performed at DCPD Units 1 and 2 are consistent with the NRC's position regarding SG tube inspections. Therefore, NRC Request 2 is not applicable and a response is not required.

NRC Question 3:

*For plants where SG tube inspections have not been or are not being performed consistent with the NRC's position on the requirements in the TS in conjunction with Criteria IX, XI, and XVI of 10 CFR Part 50, Appendix B, the licensee should submit a safety assessment (i.e., a justification for continued operation based on maintaining tube structural and leakage integrity) that addresses any differences between the licensee's inspection practices and those called for by the NRC's position. Safety assessments should be submitted for all areas of the tube required to be inspected by the TS where flaws have the potential to exist and inspection techniques capable of detecting these flaws are not being used, and should include the basis for not employing such inspection techniques. The assessment should include an evaluation of (1) whether the inspection practices rely on an acceptance standard (e.g., cracks located at least a minimum distance of x below the top of the tube sheet, even if these cracks cause complete severance of the tube) which is different from the TS acceptance standards (i.e., the tube plugging limits or repair criteria), and (2) whether the safety assessment constitutes a change to the "method of evaluation" (as defined in 10 CFR 50.59) for establishing the structural and leakage integrity of the joint. If the*

*safety assessment constitutes a change to the method of evaluation under 10 CFR 50.59, the licensee should determine whether a license amendment is necessary pursuant to that regulation.*

PG&E Response:

The SG tube inspections performed at DCPD Units 1 and 2 are consistent with the NRC's position regarding SG tube inspections. Therefore, NRC Request 3 is not applicable and a response is not required.

**Table 1**  
**Summary of DCP Unit 1 and Unit 2 SG Inspections Performed in 1R12 and 2R11**

Item	Area of SG Bundle	Probe	1R12 Inspection Scope	2R11 Inspection Scope
1.	Full Length of tubing	Bobbin	100% (Except Rows 1 and 2 U-bends)	100% (Except Rows 1 and 2 U-bends)
2.	WEXTEx top of tubesheet (TTS) region	+Point™	100% of hot leg TTS, all SGs 100% of repeat W* ARC tubes Minimum inspection extent: TTS +2 inch to TTS -8.5 inch	100% of hot leg TTS, all SGs 100% of repeat W* ARC tubes SG 2-4: 100% of cold leg TTS SG 2-1, 2-2, 2-3: 20% of cold leg TTS Minimum inspection extent: TTS +2 inch to TTS -8.5 inch
3.	Hot leg unplugged tube ends	+Point™	100% Inspection extent: tube end hot +4 inch	Not applicable
4.	Low Row U-bends (Rows 1 and 2)	+Point™	100%	100%
5.	High Row U-bends (Rows 3 and higher)	+Point™	100% of Rows 3 to 10 20% of Rows 13 to 17	100% of Rows 3 to 46
6.	Repeat PWSCC ARC indications at dented TSP	+Point™	100%	100%
7.	≥5 Volt (V) Dented TSP	+Point™	SG 1-1: 100% 1H to 4H; 20% 5H to 7H SG 1-2: 100% 1H to 7C, 20% 6C SG 1-3: 20% 1H to 7H SG 1-4: 100% 1H to 6H; 20% 7H (Note 1)	100%
8.	>2 V and < 5 V Dented TSP	+Point™	SG 1-1: 100% 1H to 4H; 20% 5H SG 1-2: 100% 1H to 7C; 20% 6C SG 1-3: 20% 1H SG 1-4: 100% 1H to 6H; 20% 7H (Note 1)	SG 2-1: 20% 1H SG 2-2: 100% 1H to 5H; 20% 6H SG 2-3: 100% 1H to 3H, 20% 4H SG 2-4: 100% 1H to 3H; 20% 4H (Note 1)
9.	≤2 V Dented TSP	+Point™	100% of DIS SG 1-1: 100% of dents >0.21 V at 1H, 20% of dents >0.21V at 2H (Note 1)	100% of DIS
10.	DOS	+Point™	100% of DOS at dented TSP 100% of ≥1.7 V DOS SG 1-1, 1-2: 100% of DOS >1.4 V and <1.7 V 100% of DOS in ARC exclusions zones	100% of DOS at dented TSP 100% of >1 V DOS SG 2-1: 100% of DOS 100% of DOS in ARC exclusions zones
11.	SPR	+Point™	100% of hot leg TSP with >2.3 V SPR Minimum of 5 largest hot leg SPR per SG	100% of hot leg TSP with >2.3 V SPR Minimum of 5 largest hot leg SPR per SG
12.	TSP ligament indications	+Point™	100% of baseline indications (LIC and LIG) 100% of new SLC 100% of SLC with DIS or DOS	100% of baseline indications (LIC and LIG) 100% of new SLC 100% of SLC with DIS or DOS
13.	Free span dings	+Point™	100% of ≥5 V free span dings 100% of ≥2 V free span dings in U-bend that are coincident with AVB location	100% of ≥5 V free span dings 100% of free span dings in U-bend
14.	Free span bobbin indications	+Point™	100% that are new or exhibit growth or change	100% that are new or exhibit growth or change
15.	New % calls at cold leg TSP	+Point™	100%	100%
16.	Loose parts	Bobbin +Point™	100% bobbin 100% +Point™ of PLP location plus surrounding tube locations	100% bobbin 100% +Point™ of PLP location plus surrounding tube locations

**Notes:**

1. For any 20 percent dent samples, a minimum of 50 dents were inspected. If the population of dents at that TSP elevation is less than 50, then 100 percent of dents at that TSP were inspected.

**Indication codes:**

DOS - distorted outside diameter support plate bobbin signal  
DIS - distorted inside diameter support plate bobbin signal at a dented TSP intersection  
SLC - suspected TSP ligament cracking bobbin signal  
LIC - TSP ligament crack +Point™ signal  
LIG - TSP ligament gap +Point™ signal  
SPR - support plate mixed residual bobbin signal  
PLP - possible loose part signal